

I. **PURPOSE AND NEED**

A. PURPOSE

Canada geese are Federally protected by the Migratory Bird Treaty Act (Act) (16 U.S.C. 703-711). Regulations governing the issuance of permits to take, capture, kill, possess, and transport migratory birds are authorized by the Act, promulgated in Title 50 Code of Federal Regulations (CFR) parts 13 and 21, and issued by the U.S. Fish and Wildlife Service (Service or we). Regulations governing the take, possession, and transportation of migratory birds under sport hunting seasons are authorized by the Act and annually promulgated in 50 CFR part 20 by the Service. In recent years, numbers of Canada geese that nest and/or reside predominantly within the conterminous United States (resident Canada geese) have undergone dramatic population growth and have increased to levels that are increasingly coming into conflict with people and causing personal and public property damage. The purpose of this Final Environmental Impact Statement (FEIS) is to evaluate alternative strategies to reduce, manage, and control resident Canada goose populations in the continental United States and to reduce related damages. Further, the objective of this FEIS and any ultimate proposal is to provide a regulatory mechanism that would allow State and local agencies, other Federal agencies, and groups and individuals to respond to damage complaints or damages by resident Canada geese. The means must be more effective than the current system; environmentally sound, cost-effective, flexible enough to meet the variety of management needs found throughout the flyways, should not threaten viable resident Canada goose populations as determined by each Flyway Council, and must be developed in accordance with the mission of the Service.

Additionally, the decision to implement an alternative strategy to manage resident Canada geese constitutes a major Federal action. Therefore, the Service is required by the National Environmental Policy Act (NEPA) (Public Law 91-190, 42 U.S.C. 4321 et seq.; 83 Stat. 852), as amended, to assess the potential impacts of any proposed action and reasonable alternatives. This FEIS documents this assessment and, together with supporting documents, considerations, data, and public comments, will be used by the Service's Director to prepare a Record of Decision.

This FEIS is a comprehensive programmatic plan intended to guide and direct resident Canada goose population growth and management activities in the conterminous United States. Where NEPA analysis is suggested or required for site-specific management or control projects carried out under the guidance of this document, analyses will "tier to" or reference the FEIS. Site-specific NEPA analysis, if required, will focus on issues, alternatives, and environmental effects unique to the project area, if not already discussed in this FEIS and subsequent Record of Decision, and may be categorically excluded, or documented in either an environmental assessment (EA) or an environmental impact statement, depending on the significance of the effects.

B. SCOPE

This FEIS applies specifically to the conterminous United States and to the subspecies/populations of Canada geese (*Branta canadensis*) that nest and/or reside predominately within this portion of the continent. Canada geese nesting within the conterminous United States are generally considered subspecies or hybrids of the various subspecies originating in captivity and artificially introduced into numerous areas throughout the conterminous United States (see section **I.C.1.a. Resident Canada Geese**

in the Flyways for further information). Canada geese are highly philopatric (propensity to return to) to natal areas and no evidence presently exists documenting breeding between Canada geese nesting within the conterminous United States and those subspecies nesting in northern Canada and Alaska. For the purposes of this FEIS, and for management purposes, the geese nesting within the conterminous United States in the months of March, April, May, or June or residing within the conterminous United States in the months of April, May, June, July, or August will be collectively referred to as "resident" Canada geese.

The recognized subspecies/populations of Canada geese are distributed throughout the northern temperate and sub-arctic regions of North America (Delacour 1954; Bellrose 1976; Palmer 1976). Historically, breeding Canada geese are believed to have been restricted to areas north of 35 degrees and south of about 70 degrees latitude (Bent 1925; Delacour 1954; Bellrose 1976; Palmer 1976). Today, in the conterminous United States, Canada geese can be found nesting in every State, primarily due to translocations and introductions since the 1940's.

The majority of Canada geese still nest in localized aggregations throughout Canada and Alaska and migrate annually to the conterminous United States in September to November to winter, with a few reaching as far south as northern Mexico. Due to the remoteness of much of the breeding area and consequent lack of detailed site-specific banding data, the exact lines of separation between various subspecies, groups and management populations are subject to considerable interpretation. Lack (1974) presented a depiction of the general distribution of the subspecies of Canada geese recognized in North America by Delacour (1954), and this is the general description, with minor modifications, adopted by most management agencies.

The distribution of Canada geese has expanded southward and numbers have increased appreciably throughout the southern portions of the range during the past several decades (Rusch et al. 1995). The 11 subspecies have been further divided into 19 management populations based on geographic distribution. The division of the various subspecies of Canada geese into management populations began in the 1950's (e.g. Hanson and Smith 1950) and is subject to continuing revision based on new information. Management of populations is generally based on leg band or neck collar recovery data that suggest similar distribution and little overlap with other populations during breeding, but more overlap often during migration and/or winter periods. Due to the high degree of philopatry to natal areas exhibited by Canada geese (believed to have contributed to the large degree of subspeciation exhibited by the group), the species has proven amenable to such subdivisions. The delineation of populations by managers is due to the desire to apply management programs (i.e. habitat and harvest management) to specific geographic areas with the intent of managing the numerical abundance of the various populations independently from neighboring or overlapping groups. The following is a brief description of the distribution of the major management populations of Canada geese covered by this FEIS (more detailed information, is available in section **III.A.1.b. Population status, trends, and distribution**):

Atlantic Flyway Resident Population (Sheaffer and Malecki 1998; Johnson and Castelli 1998; Nelson and Oetting 1998): This population nests from Southern Quebec and the Maritime Provinces of Canada southward throughout the States of the Atlantic Flyway (Connecticut, Delaware, Florida, Georgia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, and West Virginia) (**Figure I-1**). This population is believed to be of mixed racial origin (*B. c. canadensis*, *B. c. interior*, *B. c. moffitti*, and *B. c. maxima*) and is the result of purposeful introductions by management agencies, coupled with released

birds from private aviculturists and releases from captive decoy flocks after live decoys were outlawed for hunting in the 1930s.

Mississippi Flyway Giant Population (Rusch et al. 1996; Nelson and Oetting 1998): This population (*B. c. maxima*) was once near extirpation and has been reestablished in all States in the Mississippi Flyway (Alabama, Arkansas, Illinois, Indiana, Iowa, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Ohio, Tennessee, and Wisconsin). The population breeds and winters throughout this region (Figure I-2).

Great Plains Population (Nelson 1962; Vaught and Kirsch 1966; Williams 1967): The Great Plains Population consists of geese (*B. c. maxima*/*B. c. moffiti*) that have been restored to previously occupied areas in Saskatchewan, North and South Dakota, Nebraska, Kansas, Oklahoma, and Texas (Figure I-1). For management purposes, this population is often combined with the Western Prairie Population (comprised of geese (*B. c. maxima*/*B. c. moffiti*/*B. c. interior*) that nest throughout the prairie regions of Manitoba and Saskatchewan) which winter together from the Missouri

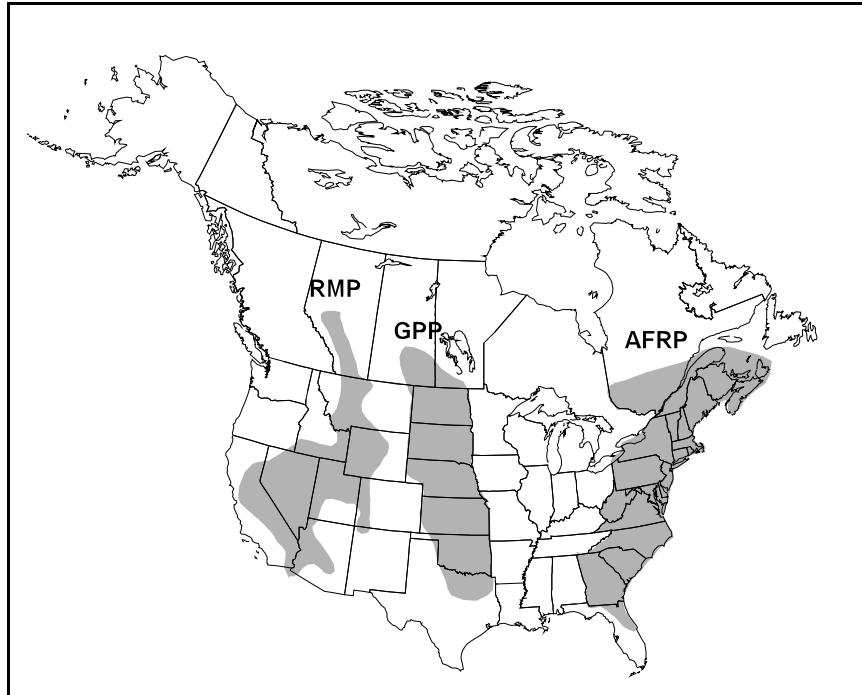


Figure I-1. Approximate ranges of Atlantic Flyway Resident Population (AFRP), Great Plains Population (GPP), and Rocky Mountain Population (RMP) of Canada geese in North America.

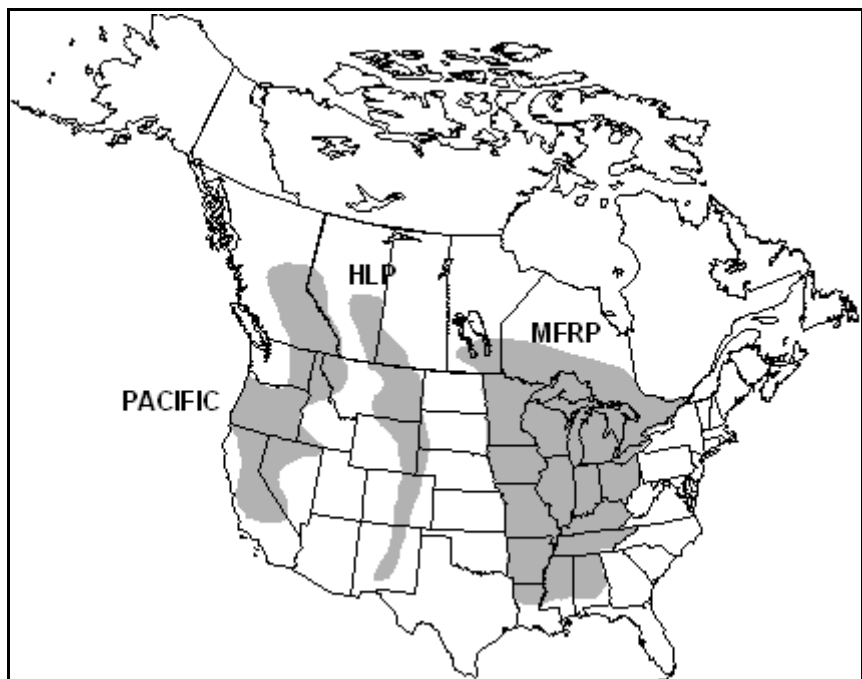


Figure I-2. Approximate ranges of the Mississippi Flyway Giant Population (MFRP), the Hi-Line Population (HLP), and the Pacific Population (PACIFIC) of Canada geese in North America.

River in South Dakota southward to Texas.

Hi-Line Population (Rutherford 1965; Grieb 1968, 1970): This population (*B. c. moffitti*) nests in southeastern Alberta, southwestern Saskatchewan and eastern Montana, Wyoming, and northcentral Colorado (**Figure I-2**). The population winters from Wyoming to central New Mexico.

Rocky Mountain Population (Krohn and Bizeau 1980): This population (*B. c. moffitti*) nests from southwestern Alberta southward through the intermountain regions of western Montana, Utah, Idaho, Nevada, Colorado Wyoming (**Figure I-1**). They winter southward from Montana to southern California, Nevada, and Arizona.

Pacific Population (Krohn and Bizeau 1980; Ball et al. 1981): This population (*B. c. moffitti*) nests from southern British Columbia southward and west of the Rockies in the states of Idaho, western Montana, Washington, Oregon, northern California, and northwestern Nevada (**Figure I-2**). The population is essentially non-migratory and winters primarily in these same areas.

The remaining subspecies/populations of Canada geese recognized in North America nest, for the most part, in arctic, sub-arctic, and boreal regions of Canada and Alaska (Lack 1974). These are encountered in the conterminous United States only during the fall, winter and spring or as a result of human placement.

Generally, the Service has stressed the need to manage geese on a population unit basis, guided by cooperatively developed Flyway management plans. However, the development of a strategy for dealing with resident Canada goose damage presents several potential problems. Because resident Canada goose populations interact and overlap with other Canada goose populations during the fall and winter, these other non-target goose populations potentially could be affected by any management action or program aimed at resident Canada goose populations during the fall and winter. Thus, to avoid potential conflicts with other Canada goose populations, most management actions for resident Canada geese have been restricted to either special early September or late winter hunting seasons when migrant populations are largely absent or, to permitted actions during the period March 11 through August 31. These spring and summer dates encompass the period when sport hunting is prohibited throughout the United States by the Migratory Bird Treaty (1916) and resulting regulations promulgated under the Migratory Bird Treaty Act (1918). However, this FEIS evaluates all time periods in an effort to explore all possible management strategies for resolving resident Canada goose conflicts.

Regulations governing the take, possession, and transportation of migratory birds under sport hunting seasons are annually promulgated in 50 CFR, part 20, subpart K, while regulations covering the issuance of permits to take, capture, kill, possess, and transport migratory birds are promulgated in 50 CFR parts 13 and 21. Furthermore, in subpart C of part 21, Specific Permit Provisions, section 21.26 is the Special Canada Goose Permit, issued only to State wildlife agencies, authorizing certain resident Canada goose management and control activities. Section 21.27 pertains to special-purpose permits which allow for the taking of migratory birds with compelling justification. In subpart D of part 21, section 21.41 pertains to general depredation permits and section 21.42 authorizes the Director of the U.S. Fish and Wildlife Service to issue depredation orders to permit the killing of migratory game birds. Sections 21.43 through 21.46 are depredation orders for specific species of migratory birds and/or specific geographic areas to address particular depredation problems.

C. NEED FOR ACTION

In North America, few birds share the wide recognition afforded the Canada goose. Wild Canada geese flying overhead in their familiar “V” formation have long been the symbol of changing seasons and connections to wild, distant places for millions of waterfowlers, bird watchers, and general citizens. In recent years, however, some Canada geese have come to symbolize something much less desirable. In many communities, increasing numbers of locally breeding Canada geese have resulted in an example of the conflict and disagreement that can occur among various publics when wildlife becomes locally overabundant and exceeds the tolerance level of some people and communities.

1. Background

a. Resident Canada Geese in the Flyways

The number of Canada geese that nest and/or reside predominantly within the conterminous United States has increased dramatically in the past 20 years. Although most of these geese are commonly referred to as “resident” Canada geese, they are actually a collection of various subspecies depending on location.

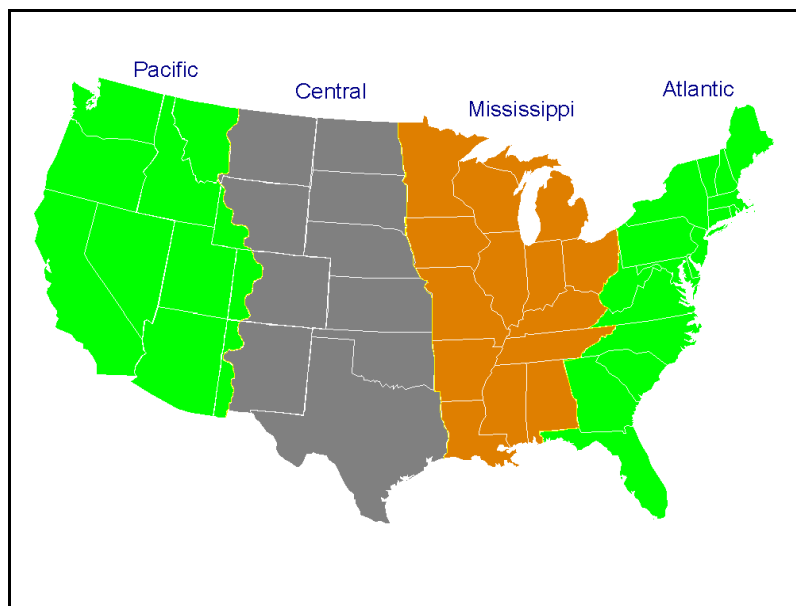


Figure I-3. Administrative Flyway boundaries.

In the eastern United States, or Atlantic Flyway (see **Figure I-3**), resident Canada geese consist of several subspecies that were introduced and established during the early 20th century after extirpation of native birds (Delacour 1954; Dill and Lee 1970; Pottie and Heusmann 1979; Benson et al. 1982). Following the establishment of a Federal prohibition on the use of live decoys in 1935, Dill and Lee (1970) cited an estimate of more than 15,000 domesticated and semi-domesticated geese that were released from captive flocks. With the active restoration programs that occurred from the 1950's through the 1980's, the population has grown to approximately one

million individuals and has increased an average of 2 percent per year over the last 10 years (Sheaffer and Malecki 1998; Atlantic Flyway Council 1999; U.S. Fish and Wildlife Service, 2004).

In the Mississippi Flyway (see **Figure I-3**), most resident Canada geese are giant Canada geese (*B. c. maxima*). Once believed to be extinct (Delacour 1954), Hanson (1965) rediscovered them in the early 1960's, and estimated the giant Canada goose population at about 63,000 birds in both Canada and the United States. In his book, *The Giant Canada Goose*, Hanson (1965) further speculated that because of

the highly successful restoration programs underway on State, Provincial, and Federal refuges, the future of the giant Canada goose was “indeed bright.” This speculation proved to be a gross underestimate of both the giant Canada goose and wildlife restoration programs. In the nearly 40 years since their rediscovery, the breeding population of giant Canada geese in the Mississippi Flyway now exceeds 1.5 million individuals and has been growing at a rate of about 6 percent per year over the last 10 years (Rusch et al. 1996; Wood et al. 1996; Nelson and Oetting 1998; U.S. Fish and Wildlife Service, 2004).

In the Central Flyway (see **Figure I-3**), Canada geese that nest and/or reside in the States of the Flyway consist mainly of three populations, the Western Prairie and Great Plains (managed collectively) and Hi-Line. These populations of large subspecies of Canada geese have increased tremendously over the last 30 years as the result of active restoration and management by Central Flyway States and Provinces. The current index for these populations in 2004 was over 837,000 birds, and has been growing at a rate of 7 percent and 4 percent, respectively, per year since 1995 (Gabig 2000; U.S. Fish and Wildlife Service, 2004).

In the Pacific Flyway (see **Figure I-3**), two populations of the western Canada goose, the Rocky Mountain Population and the Pacific Population, are predominantly comprised of Canada geese that nest and/or reside in the States of the Flyway. The Rocky Mountain Population is highly migratory, and has grown from a breeding population of about 14,000 in 1970 (Krohn and Bizeau 1980) to over 130,000 (Subcommittee on Rocky Mountain Canada Geese 2000). The 2004 estimated spring population was 152,000 and has increased 3 percent per year over the last 10 years, however the mid-winter survey estimates have shown no apparent trend since 1995 (U.S. Fish and Wildlife Service, 2004). The Pacific Population is relatively nonmigratory with most flocks wintering on or near their nesting areas. Reliable survey estimates are not available.

b. Types of Conflicts and Damages

Because most resident Canada geese live in temperate climates with relatively stable breeding habitat conditions and low numbers of predators, tolerate human and other disturbances, have a relative abundance of preferred habitat (especially those located in urban/suburban areas with current landscaping techniques), and fly relatively short distances to winter compared with other Canada goose populations, they exhibit a consistently high annual production and survival. Further, the virtual absence of waterfowl hunting in urban areas provides additional protection to those urban portions of the resident Canada goose population. Given these characteristics, these Canada goose populations are increasingly coming into conflict in both rural and urban areas with human activities in many parts of the country.

Conflicts between geese and people affect or damage several types of resources, including property, concerns about human health and safety, agriculture, and natural resources. Common problem areas include public parks, airports, public beaches and swimming facilities, water-treatment reservoirs, corporate business areas, golf courses, schools, college campuses, private lawns, athletic fields, amusement parks, cemeteries, hospitals, residential subdivisions, and along or between highways.

Property damage usually involves landscaping and walkways, most commonly on golf courses, parks, and waterfront property. In parks and other open areas near water, large goose flocks create local problems with their droppings and feather litter (Conover and Chasko, 1985). Surveys have found that while most landowners like seeing some geese on their property, eventually, increasing numbers of geese and the associated accumulation of goose droppings on lawns cause many landowners to view geese as a

nuisance, which results in a reduction of both the aesthetic value and recreational use of these areas (Conover and Chasko, 1985).

Negative impacts on human health and safety occur in several ways. At airports, large numbers of geese can create a very serious threat to aviation. Resident Canada geese have been involved in a large number of aircraft strikes resulting in dangerous landing/take-off conditions, costly repairs, and loss of human life. As a result, many airports have active goose control programs. Excessive goose droppings are a disease concern for many people (see **Appendix 8 - Scoping/Public Participation Report for Environmental Impact Statement on Resident Canada Goose Management**). Public beaches in several States have been closed by local health departments due to excessive fecal coliform levels that in some cases the presence of geese led to an undocumented assumption that the geese caused the increase in coliforms levels. Additionally, during nesting and brood-rearing, aggressive geese have bitten and chased people and injuries have occurred due to people falling or being struck by wings.

Agricultural and natural resource impacts include losses to grain crops, overgrazing of pastures, and degrading water quality. In heavy concentrations, goose droppings can overfertilize lawns and degrade water quality resulting in eutrophication of lakes and excessive algae growth (Manny et al., 1994). Overall, complaints related to personal and public property damage, agricultural damage, public safety concerns, and other public conflicts have increased as resident Canada goose populations increased.

c. Current Regulatory Framework

Normally, complex Federal and State responsibilities are involved with Canada goose control activities. All control activities, except those intended to either scare geese out of, or preclude them from using, a specific area, such as harassment, habitat management, or repellents, require a Federal permit issued by the Service. Additionally, permits to alleviate migratory bird depredations are issued by the Service in coordination with the Wildlife Services (formerly Animal Damage Control) program of the Animal Plant Health Inspection Service (APHIS/WS). APHIS/WS is the Federal Agency with lead responsibility for dealing with wildlife damage complaints. In most instances, State permits are required as well. As the number of problems with resident Canada geese have continued to grow, the Service, with its State and Federal partners, believes the development and evaluation of alternative strategies to reduce, manage, and control resident Canada goose populations in the continental United States and to reduce related damages, beyond those presently employed, are needed so that all agencies can provide the most responsible, cost-effective, biologically-sound, and efficient assistance available.

Until recently, the Service attempted to control and manage growing populations of resident Canada geese through existing annual hunting season frameworks (special and regular seasons) and the issuance of control permits on a case-by-case basis. While this approach provided relief in some areas, it did not completely address the problem. On June 17, 1999, we published a final rule establishing a new special Canada goose permit (Federal Register 1999b). The new permits are specifically for the management and control of resident Canada geese. Permits may be issued to State conservation or wildlife management agencies on a State-specific basis, so States and their designated agents can initiate resident goose damage management and control injurious geese within the conditions and restrictions of the permit program. The permits, restricted to the period between March 11 and August 31, allow increased availability of control measures, facilitate a decrease in the number of injurious resident Canada geese in localized areas, have little impact on hunting or other recreation dependent on the availability of resident Canada geese, and allow injury/damage problems to be dealt with at the State and local level, thereby

resulting in more timely control activities. These new special permits result in biologically sound and more cost-effective and efficient resident Canada goose damage management. We believe this permit satisfies the need for a more efficient/cost-effective program in the short term while allowing us to maintain direct management control.

In the long-term, however, because of the unique locations where large numbers of these geese nest, feed, and reside, we believe that new and innovative approaches and strategies for dealing with bird/human conflicts are necessary. In order to properly examine alternative strategies to control and manage resident Canada geese and develop a long-term strategy to integrate our management of these birds into a larger Flyway management-plan system, the preparation of this EIS is necessary.

2. State Questionnaire Responses

In November 1999, a questionnaire related to resident Canada goose populations and their impacts was transmitted to States via the Flyway Council Chairs (see **Appendix 1**). The purpose of the questionnaire was to collect additional background and status information on the extent of resident Canada goose problems and conflicts, help describe the affected environment, provide the basis for management alternatives, and assist in the EIS impact analysis. Responses to the thirteen questions were subsequently received from 30 States (**Table I-1**).

Table I-1. State responses to resident Canada goose questionnaire.

<u>Atlantic Flyway</u>	<u>Mississippi Flyway</u>	<u>Central Flyway</u>	<u>Pacific Flyway</u>
Delaware	Alabama	Colorado	Arizona
Florida	Illinois	Kansas	Utah
Georgia	Indiana	Montana	
Maine	Iowa	South Dakota	
Maryland	Louisiana	Wyoming	
Massachusetts	Michigan		
New York	Minnesota		
North Carolina	Missouri		
Pennsylvania	Ohio		
Rhode Island	Tennessee		
Vermont			
Virginia			
West Virginia			

a. Number of Complaints

One indicator of the extent of resident Canada goose problems is the annual number of complaints received by resource management agencies within a State. Responses ranged from less than ten (Florida, Montana, and Arizona) to hundreds of complaints annually (**Table I-2**). Unless noted otherwise in **Table I-2**, the survey responses are complaints received by the States' wildlife management agencies and may or may not include complaints directed to others, such as Wildlife Services, local parks and recreation staff, health agencies, cooperative extension agents, and other resource management agencies. While we recognize that not all complaints are directed to the States' resource management agencies, we believe that the number of State-compiled complaints about resident Canada geese still serve as an important index of the extent of problems. However, most States attempted to account for complaints received by other agencies in their estimates. For example, Minnesota reported approximately 400 complaints annually, but indicated that this accounts for only about 50% of the complaints made. A more detailed discussion of complaints and conflicts is contained in section **III. Affected Environment**.

Responding States also varied in their ability to track complaints. Some had detailed tracking systems in place, others relied on the United States Department of Agriculture Animal and Plant Health Inspection Service Wildlife Services (APHIS/WS or Wildlife Services) to provide such information, while others could only provide estimates, anecdotal evidence, or no information at all. For example, although

Kansas does not have detailed records regarding resident Canada goose complaints, their Kansas City biologist stated that,

“Urban [goose complaints] – began with 5-10 problems in 1990, last year I would guess I took 120 – 130 calls on nuisance geese,”

which may indicate a rapidly-growing problem.

Nine States provided information on the number of resident Canada goose complaints over a 4-6 year period. While complaints remained stable or even decreased in some States, five States saw complaints increase 22 - 74 percent (**Table I-3**). Some States with steady or declining numbers of complaints, such as North Carolina, still believed the number of people experiencing resident Canada goose problems continues to increase.

b. Property Damage

Another indicator of the relative scale of resident Canada goose problems is the property damage they cause. **Table I-2** shows the estimated monetary value of damage done by resident Canada geese in the most recent one-year period for which States provided information. The majority of property damage caused by geese involved clean-up and repairs of managed turf areas (e.g., parks, golf courses, athletic fields, and congregated residences) and agricultural damage. In Georgia, a recent survey found that 56% of the 319 member courses of the Georgia Golf Association consider geese to be a problem. A telephone poll of selected courses with an average number of geese indicated that typical courses spend about \$1,500 per year cleaning or repairing greens damaged by geese. Another questionnaire distributed to members of the Massachusetts Golf Course Owners Association found that 84% of the respondents reported problems of varying levels with Canada geese. Delaware reported that some golf courses had damage approaching \$20,000 on some greens.

In Maryland, information suggests annual clean-up costs to remove goose dropping from lawns, walkways and beaches and the efforts to prevent goose damages probably exceed \$150,000. Minnesota pointed to a 1998 survey of Twin Cities agencies and landowners in which economic losses from Canada goose populations were estimated to be \$692,750 annually. Ohio surveyed landowners who complained about geese in 1998 and 1999 and found they averaged spending \$350 a year trying to keep geese away. A more detailed discussion of property damage is contained in section **III.B.3. Economic Considerations**.

Table I-2. Characteristics of complaints regarding resident Canada geese received by the State wildlife resource agencies.

Annual Complaints by Type (Number or %) ^{a, b}								
Flyway/State	Nuisance	Health/Safety	Property/ Agricultural	Natural Resource	Other	Total	Percentage (%) of All Complaints	Damage during most recent one- year period
Atlantic:								
Delaware	10-15	2-3H, 2S	3-6	2	--	20-30	80-90%	>\$100,000
Florida	6	-- H, 2S	--	--	--	8	85%	Unknown
Georgia ^c	--	-- H, S	--	--	--	210 ^e	40%	\$456,000
Maine	Most	-- H, S	--	--	--	30	80%	Unknown
Maryland ^d	41%	-- H, <1% S	57%	1%	--	100 ^d	72%	\$350,000 ^e
Massachusetts	34%	3% H, -- S	6%	--	56%	85	50%	Unknown
New York	50%	--H, S	45%	--	5%	>100	50%	Millions
North Carolina	51%	Many H, 10% S	39%	--	--	110	Unknown	Unknown
Pennsylvania	--	--H, S	--	--	--	33	50%	~\$2 Million
Rhode Island	90%	10% H, S	--	--	--	30-60	98%	Unknown
Vermont	Most	-- H, S	Some	--	--	12	50%	Unknown
Virginia ^c	178	181 H, S	418	36	--	813	Unknown	\$588,500 ^e
West Virginia	62	18 H, S	17	1	--	98	75-80%	\$25,000
Mississippi:								
Alabama	--	--H, S	--	--	--	Unknown	Unknown	Unknown
Illinois	75-94%	-- H, 6-12.5% S	12.5%	--	--	n	Unknown	Unknown
Indiana ^c	--	52 H, S	329	--	--	150-160	Unknown	\$7,580
Iowa	--	-- H, S	80%	--	20%	380 ^e	75%	\$12-20,000
Louisiana	--	Most H, S	--	--	--	101	80%	<\$5,000
Michigan	Most	Some H, S	Some	--	--	5	75%	~\$250,000
Minnesota	16%	1% H, S	83%	--	--	~400	50%	Millions
Missouri ^c	5	61 H, S	100	--	--	295	<30%	\$377,025 ^e
Ohio ^f	692	130 H, 487 S	319	--	--	166	90%	\$115,200
Tennessee	52%	14% H, S	34%	--	--	692 ^f	Unknown	\$9,400
Central:								
Colorado	Most	Some H, --S	2-3	--	--	60-80	>66%	Unknown
Kansas	79%	--H, 5% S	12%	--	4%	255	>90%	Unknown
Montana	--	-- H, S	--	--	--	<10	25%	Unknown
South Dakota	Unknown	Unknown H, S	300	--	--	>300	>90%	\$396,500
Wyoming	Some	--H, S	Most	--	--	30-40	70%	\$2,064
Pacific:								
Arizona	5	-- H, S	--	--	--	<5	Unknown	Unknown
Utah	--	-- H, S	Most	--	--	25	75%	Unknown

^a If States provided the total number of complaints for many years, the average number/year is shown.

^b Where percentages are used, they are often based on a period of successive years.

^c In Georgia, Maryland, Virginia, and Missouri, estimates were provided by the USDA-Wildlife Services office in that State.

^d All resident Canada goose complaints received by the Maryland DNR are referred to USDA-Wildlife Services. An estimated 100 complaints are received by the Maryland DNR annually. USDA-Wildlife Services received 139 complaints in Maryland during 1999. This means that 72% of complaints received by USDA-Wildlife Services may have originally been lodged with the Maryland DNR.

^e Total complaints for Indiana was determined by calls made to a Wildlife Telephone Hotline created in 1998 through a joint effort by the Indiana DNR and USDA-Wildlife Services.

^f In Ohio, many complainants reported multiple problems, so the total does not equal the number of individual complaints.

Some States were able to provide specific information on agricultural damage caused by resident Canada

geese. In the southeast, Georgia reported agricultural damage including geese feeding on winter grains and competition with cattle for grain in open troughs. Georgia further estimated that if 80 agricultural complaints are reported each year at an average loss of \$250 (estimated), the total agricultural loss in Georgia would be approximately \$20,000. Maryland reported that managed turf and agricultural damage was estimated at \$200,000 per year. The threat of disease transmission to poultry was another concern in Maryland with major poultry companies instructing growers to keep wild ducks and geese away from broiler houses. Virginia reported agricultural damage estimated at \$241,000 with costs including damaged winter grains and spring crops such as corn, peanuts, vegetables, and pasture.

Table I-3. Comparison of complaints received by State wildlife agencies regarding resident Canada geese during 1995-96 and most recent reports (from State questionnaire results).

Flyway/State	Average number of complaints during 1995 and 1996	Average number of complaints during the last two reporting years ^a	Percent change
Atlantic:			
Georgia	254	254	+0
Maryland	118	144	+22
Pennsylvania	56	42	-24
West Virginia	114	116	+1
Mississippi:			
Iowa	117	115	-2
Minnesota	132	212	+61
Missouri	92	131	+43
Ohio	334	583	+74
Central:			
South Dakota	113	150	+33

^a The last two reporting years for Georgia, Maryland, West Virginia, Iowa, Missouri, and Ohio were 1998 and 1999. The last two reporting years for Pennsylvania, Minnesota, and South Dakota were 1997 and 1998.

In the northeast, Massachusetts reported estimated damage to cranberry bogs at \$119,887 per year over a 3-year period in the early 1990's. New York reported managed turf and agricultural damage at over \$1 million annually. Pennsylvania recently summarized damage amounts from complaints received by the Pennsylvania Game Commission and from surveys conducted by the Pennsylvania Department of Conservation and Natural Resources and the Pennsylvania Farm Bureau. Total crop damage in Pennsylvania was estimated at approximately \$788,000 annually. In West Virginia, agricultural damage was estimated at \$8,400 annually.

In the Midwest, Indiana estimated damage to corn at \$1,050, while Iowa indicated 75-85% of calls complaining about resident Canada goose involve agricultural damage. Losses to Iowa producers were estimated at \$7,500 in 1999 and \$12,000 in 1998. Minnesota reported that during the five-year period

from 1994-98, 63% of the 853 resident Canada goose complaints involved crop damage. In 1998, Minnesota farmers estimated an average of \$1,200 in crop loss per complaint, resulting in a total damage estimate of \$230,400. However, Minnesota reported that many farmers are tolerating crop damage from geese. In Missouri, agricultural damage was estimated at \$2,000.

In South Dakota, most complaints about resident Canada geese involved conflicts with agriculture. Complaints from South Dakota producers commonly peak in May, June, and July when Canada goose breeding pairs, goslings, and molting geese, actively forage on newly emerged soybeans, corn, and small grains. Typical complaints involved 20-200 birds that moved from wetlands into adjacent grain fields. Agricultural damage estimates from 300 South Dakota farmers totaled \$396,500 for 1999; however, actual losses are estimated by South Dakota to be 25-50 percent higher since all losses are not reported.

Wyoming noted that 25 agricultural damage claims totaling \$7,942 were paid during 1994-1999. A more detailed discussion of agricultural depredation is contained in section **III.B.3.c. Agricultural Crops**.

c. Natural Resource Damage

Thirteen of the 30 responding States listed some level of concern about resident Canada goose impacts on natural resources. The most commonly listed was degradation of water quality by either fecal contamination or erosion from areas denuded by goose grazing and trampling. Pennsylvania indicated that water quality degradation by resident Canada geese occurred in about 30% of all State parks. Missouri reported that fecal deposits from large concentrations of resident Canada geese on some lakes resulted in algal blooms that caused oxygen depletion, and in some instances led to fish kills.

Natural resource damage, in the form of increased erosion, shoreline destabilization, destruction of newly seeded wetland restoration and mitigation sites, and loss of natural vegetation in marshes and impoundments resulting from overgrazing by resident Canada geese, was noted by a number of States. Both Minnesota and Maryland pointed to the impact of geese on natural wild rice beds, while Maryland, Pennsylvania, and Tennessee noted that resident goose populations are feeding to a significant degree on crops and habitat maintained as food sources and cover for migrant geese and other waterfowl.

Maryland also noted concern about the potential wildlife disease threat posed by concentrations of resident Canada geese. Local concentrations of resident Canada geese may congregate around impoundments where water levels have been lowered. The remaining stagnant pools can be contaminated by fecal material and are a potential source of avian diseases, especially when temperatures are high. Maryland cited a 1998 survey conducted by the USGS National Wildlife Health Research Center that found 17% of 35 resident Canada geese sampled at Blackwater National Wildlife Refuge tested positive for duck virus enteritis (DVE). Maryland points out that these birds serve as a reservoir for this highly contagious disease and pose a serious threat to other birds utilizing Blackwater Refuge.

Michigan and Minnesota pointed out that their wildlife staff is spending more time and resources responding to resident Canada goose issues at the expense of traditional natural resource management activities such as habitat restoration and protection. Furthermore, Michigan noted that more money would be available to implement new ecosystem-management initiatives if the cost to manage resident geese was less. A more detailed discussion of impacts on natural resources is contained in section **III.A.2. Natural Resources**.

d. Threat to Human Safety

Concern over increasing numbers of resident Canada geese at airports and the increased potential for air strikes was the top human safety concern of responding States. We note that the questionnaire which States responded to indicated it was not necessary to provide Federal Aviation Administration (FAA) records on bird strikes with civilian aircraft. Because of this, some States that have concerns about Canada geese at airports may not have included information about bird strikes in their responses. Despite this logistic problem, 18 States still listed this concern. A more detailed discussion of aircraft safety is contained in section **III.B.4.a. Airports**.

Aggression by resident Canada geese to people and traffic problems caused by geese were the second most common human safety concerns listed by responding States, with 13 States. In discussing goose aggression towards people, several States stated that children and senior citizens had a greater risk of injury because they lacked the strength and maneuverability to avoid attacks. Injuries ranged from small nips and scratches, to more serious bruises and cuts, to broken bones suffered during falls. Ohio reported 107 instances of Canada goose attacks on people in 1999 and 94 cases of geese causing traffic hazards were reported. Another human safety concern mentioned by 4 States was ground made slippery by goose feces. A more detailed discussion of road hazards is contained in section **III.B.4.a. Road Hazards**.

e. Human Disease Risk

Most responses from the States regarding the risk of disease transmission from resident Canada geese to humans could be categorized as “concerned, but unable to substantiate.” In other words, there is a concern among public resource management personnel that resident Canada geese have the ability to transmit diseases to humans, but a direct link is difficult to establish due to the expense of testing and the difficulty of tracing disease pathogens back to Canada geese. Studies have confirmed the presence of disease pathogens in goose feces, so presence of feces in water or on ground where humans may contact them is a legitimate health concern (see section **III.B.5.a. Waterborne Disease Transmission**). Clark (in press) documented between 2 and 4 percent toxin expression for Canada goose droppings. State natural resource agencies often do not have the expertise to deal with human health and disease questions and have to rely on other agencies’ capabilities.

Some States provided specific examples about disease risk to humans from resident Canada geese. In Massachusetts, no substantiated claims were reported, but at least one doctor diagnosed an infection “resulting from Canada geese.” New York found high coliform counts were correlated with an abundance of Canada geese and gulls on the reservoirs that supply New York City. The city implemented an intensive bird-hazing program as a solution in lieu of building a multi-billion dollar water filtration plant. In North Carolina, a depredation permit was issued to a private citizen because of a possible allergic reaction to large amounts of goose droppings on his property after the complainant’s physician provided a letter of support. Tennessee observed increased counts of *E. coli* at beaches managed by the U.S. Army Corps of Engineers and the Tennessee Valley Authority. Health departments had threatened to close beaches if no action was taken. After removal of Canada geese from these areas, *E. coli* levels dropped. In Virginia, the Occoquan Sewage Authority recorded high levels of bacteria and implicated resident geese as the cause. Similarly, the Virginia Department of Health believed resident geese were the cause of high bacteria levels found at The Little Keswick School in Albemarle County. Illinois reported histoplasmosis was diagnosed in a patient mowing an area contaminated with Canada goose feces. In Missouri, although no direct link was established, droppings from Canada geese were

believed to have caused a giardia outbreak that affected 18 people, three of whom were hospitalized. In Washington, local health districts documented *E. coli* contamination, probably caused by waterfowl feces, of beaches in the Seattle and Vancouver areas. A more detailed discussion of possible human safety impacts is contained in section **III.B.5. Human Safety**.

f. Other Damage

Aside from property and agricultural damage and safety/health risks, States identified several other areas of concern regarding resident Canada goose populations.

A common complaint about resident Canada geese is the general nuisance associated with excessive feces in areas frequented by people. Beyond the real and perceived potential health and safety risk they pose, goose feces often reduces the aesthetic appeal of these areas and may ultimately reduce public use. Ohio points out that many individuals and businesses that depend on income from public recreation areas, such as beaches and campgrounds, suffer economic hardship when the public avoids these areas due to the overabundance of goose feces. Also, unfavorable public opinion resulting from excessive feces and other nuisance problems can encourage negative attitudes towards Canada geese, specifically, and wildlife management in general. The overabundance of resident Canada geese, and the problems resulting from them, may cause public opinion to change from geese being viewed as a valued wildlife resource to being seen as pests.

Resident Canada geese can also unintentionally serve as live decoys, attracting migratory geese to problem areas. This attraction can exacerbate existing problems, or cause new ones, and concentrate birds in small areas, potentially facilitating the spread of avian disease.

g. Future Levels of Complaints and Damage

The majority of the 30 responding States felt that complaints and damage associated with resident Canada geese would continue to increase as goose populations increase. Only Florida, Massachusetts, Rhode Island, and Tennessee felt that complaints and damage would remain stable or would only slightly increase. However, Massachusetts pointed out that its current level of complaints was already high, so having a stable level of complaints was not seen as a positive outcome. Kansas and Iowa predicted that rising resident Canada goose populations would level off sometime in the future and result in a correlating stabilization in the number of complaints and damage. Iowa further predicted that breeding habitat saturation and implementation of effective damage abatement and population controls would cause the population and complaints to level off, whereas Kansas felt that it would occur in response to more liberal hunting seasons. All other responding States felt that damage and/or complaints related to resident Canada geese would increase in the coming years.

The most commonly mentioned reason for the expected rise in complaints is the continued increase of resident Canada goose populations. Some States believed this would be especially prevalent in urban areas or other specific areas of their States. Some States also pointed to the increased development of urban areas as another factor fueling the increase in complaints and conflicts. Increased development of urban areas increases the type of managed turf habitat attractive to geese, increases areas within which it will be difficult to use hunting to control Canada goose populations, and brings a higher density of people into contact and possible conflict with the geese. A third reason mentioned for the expected rise in the number of complaints is the increased irritation levels that will be experienced by people having

conflicts with resident Canada geese. Repeated nuisance encounters with Canada geese, lower tolerances for agricultural damage, control techniques that disperse nuisance geese to new problem sites, and dissatisfaction with ineffective control methods may cause citizens to report complaints at a higher rate than currently experienced. Missouri echoed the feelings of many States:

“If we continue to operate with current management options, populations will continue to increase and damages will be measured in millions of dollars rather than tens of thousands as they are now [in Missouri]. Although the financial cost is substantial, an even greater cost may be the public’s loss of faith in our ability to reduce populations and a growing negative attitude about geese.”

h. Past Resident Canada Goose Management Activities

When asked about past efforts to resolve human-goose conflicts, 25 of 30 States indicated translocation and non-lethal abatement techniques, such as scare efforts, habitat modification, barriers, and chemical treatment, as the most frequent activities. Other commonly mentioned management activities include hunting, both regular and special seasons (23 States), providing information or technical guidance (18 States), and egg or nest destruction (12 States). Six States (Delaware, Maryland, Minnesota, New York, Rhode Island, and Virginia) listed capture and euthanization of birds as a past activity.

i. Potential to Relocate

Few responding States indicated that relocating birds is an option for future management of problem resident Canada goose populations. In fact, 19 of the 30 States said that relocation was not an option and Georgia, Indiana, and Minnesota, which have ongoing relocation programs, believed that sites where birds could be moved were decreasing and would not be available in the future. New York’s response was typical of many States:

“We know of no areas in New York State where there is a desire to increase local populations of resident geese through relocation of birds from problem areas. We have not allowed in-state translocation to alleviate goose problems for many years and are reluctant to do so now. Translocation of adult geese to high harvest areas may be more socially acceptable than capture and euthanasia, but a number of issues need to be addressed, including potential for disease transmission and translocated geese would contribute to conflicts near release sites. Furthermore, there are relatively few areas in New York that may be suitable for release of translocated birds, so it is unlikely that this would ever be a viable option for alleviating many of the conflicts associated with resident geese in our State.”

A number of States referred to studies that indicated relocation of adults was ineffective in alleviating nuisance problems as large numbers of adults subsequently returned to areas from which they were removed or became a problem near the release site.

Other States, such as Maine, Missouri, and South Dakota, indicated that they only have limited release sites available for potential future relocations. South Dakota pointed out that many wildlife professionals in their Department are not convinced relocation is a good strategy since it results in moving the problem to other parts of the State. South Dakota also pointed to a July 1996 relocation of 805 Canada geese from Lake County to the Missouri River in central South Dakota that cost \$10,000 and expended 505 man-hours.

Only 5 States, Arizona, Florida, Iowa, Tennessee, and Wyoming, indicated that relocation of nuisance

resident Canada geese is a viable option for them and relocation sites are available.

D. AUTHORITY AND RESPONSIBILITY

1. U.S. Fish and Wildlife Service, Department of the Interior

Canada geese, like all other migratory birds, are an international resource. Migratory birds are protected under four bilateral migratory bird treaties the United States entered into with Great Britain (for Canada in 1916 as amended in 1999), the United Mexican States (1936 as amended in 1972 and 1999), Japan (1972 as amended in 1974), and the Soviet Union (1978). Regulations allowing the take of migratory birds are authorized by the Migratory Bird Treaty Act (16 U.S.C. 703 - 711), and the Fish and Wildlife Improvement Act of 1978 (16 U.S.C. 712). The Migratory Bird Treaty Act (Act), which implements the above-mentioned treaties, provides that, subject to and to carry out the purposes of the treaties, the Secretary of the Interior is authorized and directed to determine when, to what extent, and by what means it is compatible with the conventions to allow hunting, killing, and other forms of taking of migratory birds, their nests, and eggs. The Act requires the Secretary to implement a determination by adopting regulations permitting and governing those activities.

Canada geese are Federally protected by the Act by reason of the fact that they are listed as migratory birds in all four treaties. Because Canada geese are covered by all four treaties, regulations must meet the requirements of the most restrictive of the four. For Canada geese, this is the treaty with Canada. We have prepared this EIS compatible with its terms, with particular reference to Articles VII, V, and II.

Each treaty not only permits sport hunting, but permits the take of migratory birds for other reasons, including scientific, educational, propagative, or other specific purposes consistent with the conservation principles of the various Conventions. More specifically, Article VII, Article II (paragraph 3), and Article V of "The Protocol Between the Government of the United States of America and the Government of Canada Amending the 1916 Convention between the United Kingdom and the United States of America for the Protection of Migratory Birds in Canada and the United States," provides the authority for allowing the take of migratory birds for reasons other than sport hunting.

Article VII authorizes permitting the take, kill, etc., of migratory birds that, under extraordinary conditions, become seriously injurious to agricultural or other interest.

Article V relates to the taking of nests and eggs and states:

"The taking of nests or eggs of migratory game or insectivorous or nongame birds shall be prohibited, except for scientific, educational, propagating, or other specific purposes consistent with the principles of this Convention..."

Article II, paragraph 3, states that, in order to ensure the long-term conservation of migratory birds, migratory bird populations shall be managed in accord with conservation principles and states:

"Subject to laws, decrees, or regulations to be specified by the proper authorities, the taking of migratory birds may be allowed at any time of the year for scientific, educational, propagative, or other specific purposes consistent with the conservation principles of this Convention."

Additionally, treaties with both Japan (Article III, paragraph 1, subparagraph (b)) and the Soviet Union (Article II, paragraph 1, subparagraph (d)) provide specific exceptions to migratory bird take prohibitions for the purpose of protecting persons and property. The treaty with Mexico requires, with regard to migratory game birds, that there be a “closed season” on hunting and that hunting be limited to four months in each year.

As stated above, the implementation of these various Conventions is accomplished through the Migratory Bird Treaty Act (Act). Section 2 of the Act specifically states:

“Unless and except as permitted by regulations made as herein after provided in this subchapter, it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or eggs of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof,.....”

Further, Section 3 of the Act authorizes and directs the Secretary of Agriculture¹:

"from time to time, having due regard to the zones of temperature and distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, to determine when, to what extent, if at all, and by what means, it is compatible with the terms of the convention to allow hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any such bird, or any part, nest, or egg thereof, and to adopt suitable regulations permitting and governing the same, in accordance with such determinations, which regulations shall become effective when approved by the President".

2. Wildlife Services, Animal and Plant Health Inspection Service, U.S. Department of Agriculture

The United States Department of Agriculture Animal and Plant Health Inspection Service Wildlife Services program is directed by law to protect American agriculture and other resources from damage associated with wildlife. The primary statutory authority for the Wildlife Services program is the Animal Damage Control Act of 1931 (7 U.S.C. 426-426c; 46 Stat. 1468), as amended in the Fiscal Year 2001 Agriculture Appropriations Bill, which provides that:

“The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program. The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day before the date of the enactment of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2001.”

In 1988, Congress strengthened the legislative mandate of Wildlife Services with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

¹ The authority of the Secretary of Agriculture with respect to the Migratory Bird Treaty was transferred to the Secretary of the Interior in 1939 pursuant to Reorganization Plan No. II. §4(f), 4 Fed. Reg. 2731, 53 Stat. 1433.

"That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and bird species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."

3. The Role of States

While the Federal government has ultimate authority and responsibility, the States are also involved in migratory bird management and have considerable input and involvement in regulatory issues. In fact, the Act expressly provided that nothing shall prevent States from making or enforcing laws which give further protection to migratory birds. State regulations can always be more restrictive than Federal migratory bird regulations. Bean (1983) described this Federal/State relationship as:

"From the foregoing [discussion of Federal commerce power], it is clear that the Constitution, in its treaty, property, and commerce clauses, contains ample support for the development of a comprehensive body of federal wildlife law and that, to the extent such law conflicts with state law, it takes precedence over the latter. That narrow conclusion, however, does not automatically divest the states of any role in the regulation of wildlife or imply any preference for a particular allocation of responsibilities between the states and the federal government. It does affirm, however, that such an allocation can be designed without serious fear of constitutional hindrance. In designing such a system, for reasons of policy, pragmatism, and political comity, it is clear that the states will continue to play an important role either as a result of federal forbearance or through the creation of opportunities to share in the implementation of federal wildlife programs."

The relationship between the Service and the States for setting migratory game bird hunting regulations is well established and documented (Blohm 1989). While the relationship regarding other migratory bird issues is not as easy to describe or as well-established, the Service and the States generally cooperate on management issues. In the case of migratory non-game birds, the States usually make their positions and recommendations known individually. In the case of migratory game birds, the States generally work collectively through the Flyway Councils. The Flyway Council system is a longstanding and well-established formal process that assures State interests are considered fully in the establishment and promulgation of Federal regulations governing migratory game bird hunting and other migratory game bird issues (USDI 1988). In the case of resident Canada geese, the States, through the Flyway Councils, have assumed an active leadership role in the management of these populations (see section **I.E. Flyway Council Management Plans** and **Appendices 2 - 5**).

E. FLYWAY COUNCIL MANAGEMENT PLANS

The Atlantic, Mississippi, Central and Pacific Flyway Councils are administrative units for migratory bird management in the flyway system. Flyway Councils, which are comprised of representatives from member States and Provinces, make recommendations to the Service on matters regarding migratory game birds. Each Flyway Council has a Technical Committee that advises its respective Council on issues and provides recommendations regarding management activities. The Flyway Councils work with the Service and Canadian Wildlife Service to manage populations of Canada geese that occur in their geographic areas. There are large numbers of resident Canada geese in each Flyway, and accordingly,

cooperative Flyway management plans have been developed to address these populations. Structurally, the plans are similar, and each plan presents an overall goal and associated objectives/strategies. A commonality among the goals is the need to balance the positive aspects of resident Canada geese with the conflicts they can cause. In broad terms, objectives identified by the flyway management plans to meet these goals fall into three categories: population objectives, harvest management, and nuisance control/damage relief (**Table I-4**). Flyway population objectives have been incorporated into the FEIS to help define its objectives for acceptable population reduction and management.

1. Atlantic Flyway

- a. History

The original stock of pre-settlement resident Canada geese was extirpated following European arrival in North America. The present-day resident population was introduced and established during the early 20th century by birds released by private individuals in the early 1900's. The resident goose population in New York was among the first established, with free-flying birds reported in 1919 near a State game farm.

When the use of live decoys for hunting was prohibited in 1935, captive flocks of domesticated or semi-domesticated geese were released. From the 1950s to the 1980s, wildlife agencies in many Atlantic Flyway States were actively involved in relocation and stocking programs to establish resident populations, primarily in rural areas. These programs were highly successful and most were discontinued by 1990. The first management plan for these birds was developed in 1989, when it became apparent that resident geese were contributing significantly to sport harvests and human/goose conflicts were increasing. Resident geese are now the most numerous goose population in the flyway, and in 1999 the Atlantic Flyway Council approved their Flyway management plan (Atlantic Flyway Council 1999).

Table I-4. Recent resident Canada goose population estimates (2001-03 average) and population objectives on a Flyway basis.

Current Resident Canada Goose Population^a	Atlantic Flyway	Mississippi Flyway	Central Flyway	Pacific Flyway
U.S.	1,148,536	1,292,298	528,948	218,311
Canada	269,439	152,434	343,286	372,686
Total	1,417,975	1,444,732	872,234	590,996
<hr/>				
Resident Canada Goose Population Objective	Atlantic Flyway^b	Mississippi Flyway^c	Central Flyway^d	Pacific Flyway
U.S.	620,000	949,000	368,833 - 448,833	54,840 – 90,900 ^e
Canada	30,000	183,000		35,750 – 56,250 ^e
Total	650,000	1,132,000		90,590 – 147,150 ^e

^a Moser and Caswell, in press.

^b Atlantic Flyway Council Section 1999.

^c Population objective numbers in the management plan were revised in 2001 (Mississippi Flyway Council 2001).

^d Only U.S. States provided population objectives (Gabig 2000).

^e Lower end of the Pacific Flyway population objective for the Pacific Population of Western Canada geese derived from “Restriction Level” and upper end derived from “Liberalization Level” as shown in *Management Plan for the Pacific Population of Western Canada Geese* (Subcommittee on Pacific Population of Western Canada Geese 2000). While the cited report refers to numbers of pairs, nests, and individual geese, the numbers shown here have been converted to numbers of individual geese.

b. Management Plan Goal

The goal of the Atlantic Flyway management plan (AFMP) is:

“Manage resident Canada goose populations in the Atlantic Flyway to achieve an optimal balance between the positive values and conflicts associated with these birds.” (Atlantic Flyway Council 1999).

c. Population Objectives

Within the AFMP, the Atlantic Flyway established a specific population objective of 650,000 resident Canada geese, according to the spring survey, with a further objective of reducing the population to this

level by 2005. The overall population objective is further distributed throughout the Flyway at objective levels set by the States and Provinces within the Flyway. These levels were derived independently based on the States' respective management needs and capabilities (**Table I-5**). In some cases, these objectives are an approximation of population levels from an earlier time when problems were less severe. In other cases, objectives are calculated from what is professionally judged to be a more desirable or acceptable density of geese. For States and Provinces where resident geese have recently become established, management objectives are near current population levels. Further, unlike some traditional population objectives for waterfowl, the Flyway-established objectives for resident Canada geese represent an optimal population size, not a minimum number. However, it should be noted that this population size is only optimal in the sense that it is the Flyway States' best attempt to balance the many competing considerations of both consumptive and nonconsumptive users. The Atlantic Flyway Plan further states that population objectives presented in the plan may be revised periodically in response to changes in goose populations, damage levels, public input, or other factors (Atlantic Flyway Council 1999). Continued monitoring of the breeding population with spring surveys will be essential for tracking effectiveness of control measures and other management on resident goose populations. Several research topics that will aid population management are also suggested. These topics include development of population models to be used in stimulating development of new population-management options, and conducting basic research on population ecology with a focus on molt migrations of resident geese and implications to goose management.

d. Harvest Management

Maximizing opportunities for use and appreciation of resident Canada geese, consistent with population goals is the primary objective noted in the Flyway's management plan. The Flyway anticipates a two-pronged approach that would increase hunting opportunities while maintaining public appreciation of geese for a variety of scientific and aesthetic activities. Resident Canada geese annually provide a harvest opportunity in excess of 200,000 birds for approximately 70,000 hunters in the Atlantic Flyway States. Much of this opportunity occurs in areas not frequented by migrant Canada geese. However, because of increasing complexities in managing goose populations, the Flyway believes future harvest management will require more flexible regulations that allow desired harvests of resident geese to be reached while minimizing harvest on other Canada goose populations. Strong emphasis in the Plan is placed on fostering positive public attitudes towards geese and continuing a dialogue with the public about Canada goose management. The Flyway Plan recommends addressing the lack of information on the public's outlook about goose issues with a Flyway-wide survey that would be used to communicate more effectively with the public on resident Canada goose management issues. The Plan also identified the continuance of harvest monitoring as a high priority. Further, the Plan recommended the development of techniques to estimate proportions of resident geese in the harvest (to more effectively monitor harvest), and additional clarification of band-reporting rates with a reward-band study to monitor harvest, survival, and distribution.

Table I-5. Current spring population estimates (2001-03 average) and population objectives for resident Canada geese in States and Provinces of the Atlantic Flyway (Atlantic Flyway Council 1999; Moser and Caswell, in press).

State/Province	Population Estimate ^a	Population Objective
Connecticut	30,817	15,000
Delaware	7,792	1,000
Florida	5,000	<5,000
Georgia	62,333	30,000
Maine	12,500	15,000
Maryland	69,467	30,000
Massachusetts	29,532	20,000
New Jersey	95,508	41,000
New Hampshire	20,325	~16,000
New York	161,662	85,000
North Carolina	107,667	<30,000
Pennsylvania	235,695	~100,000
Rhode Island	4,167	3,000
South Carolina	63,000	20,000
Vermont	7,395	5,000
Virginia	217,409	180,000
West Virginia	18,267	24,000
Total – U.S.	1,148,536	620,000
Ontario - AF portion	247,300	20,000
Prince Edward Island	9,600	2,000
Maritimes	12,539	0
Total – Canada	269,439	30,000
TOTAL - U.S. and Canada	1,417,975	650,000

^a Moser and Caswell, in press.

e. Nuisance Control and Damage Relief

The main objective for the Flyway is to permit a wide variety of effective and efficient options for damage relief and conflict resolution for problems associated with resident Canada geese. While the Flyway selects sport hunting as the primary option for controlling goose problems, it is not always practical, especially in urban areas. Thus, the Flyway believes an integrated approach that includes other control activities needs to be implemented. Further, for the reasons discussed in section **I.C.1.c. Current Regulatory Framework**, the Flyway considers the current Federal permitting process inadequate for meeting the needs of landowners to reduce goose problems and strongly recommends that the Federal government establish a depredation order or conservation order that allows States and Provinces the flexibility to determine needs for controlling resident geese in their areas. However, within any new system, consideration should be given to protecting migrant Canada geese. The Flyway also recognizes the need to utilize other damage-control management techniques outside lethal control in an integrated approach to resolve human/goose conflicts and believes a directly related strategy will be to develop and distribute information on control programs to the public for use on private lands. The Plan also recommends research documenting the type and extent of goose damage and evaluating the effects of

control measures. To accomplish this, in part, the Flyway believes establishment of a system to monitor numbers and types of complaints will be an important component.

2. Mississippi Flyway

a. History

Early European settlers to the upper Midwest found numerous resident giant Canada geese (*B. c. maxima*). However, because of unregulated hunting, egg-collecting, and wetland destruction, resident Canada geese had disappeared from much of their historic range by the early 1920's and 1930's. Privately maintained flocks of captive Canada geese, kept for food and use as live decoys, subsequently provided a source for States seeking to reestablish resident populations. Efforts to establish small, free-flying, self-sustaining flocks of giant Canada geese began as early as the 1920's in Michigan and 1930's in Minnesota, Wisconsin, and Ontario. During the 1940's and 1950's, State and Federal agencies established giant Canada goose restoration programs in Manitoba, Minnesota, Missouri, Ohio, and Wisconsin. State wildlife agencies in Illinois, Indiana, Iowa, Louisiana, and Tennessee began restoration efforts in the 1960's, while at the same time a Federal effort to establish resident populations on national wildlife refuges in Alabama, Mississippi, and Tennessee was begun. In the 1970's and 1980's, State efforts to establish giant Canada goose populations commenced in Alabama, Arkansas, Kentucky, and Mississippi. Beyond these restoration efforts, management of giant Canada geese was given little consideration in the Mississippi Flyway in the 1960's and 1970's because numbers and harvest of this population were small compared to those of other goose populations and because giant Canada geese were not widely distributed. Resident Canada geese are now the most widespread and largest single population of Canada geese in the Mississippi Flyway. In 1996, the Mississippi Flyway Council approved a giant Canada goose management plan in an effort to develop a comprehensive approach to managing the population (Giant Canada Goose Committee 1996).

b. Management Plan Goal

The goal of the Flyway Management Plan (Plan) is:

“To manage the population of giant Canada geese in the Mississippi Flyway at a level that provides maximum recreational opportunities consistent with social acceptability”(Giant Canada Goose Committee 1996).

c. Population Objectives

To meet the goal, the Plan establishes a population objective of approximately 1 million giant Canada geese, as measured by spring surveys, distributed in the Flyway in proportion to state and provincial objectives. The objective essentially is the sum of state and provincial objectives in the Flyway. However, the Plan recognizes that there are problems associated with the distribution of giant Canada geese in some states and provinces, and indicates that one of the major challenges for goose managers in the future will be to provide the recreational opportunities the public has grown accustomed to and, at the same time, modify population densities of giant Canada geese to minimize human/goose conflicts.

The Plan places a high priority on monitoring the population, and considerable progress has been made in establishing operational spring surveys in Flyway states and provinces since the Plan was developed in 1996. State/Provincial population objectives and spring-survey estimates are shown in **Table I-6**.

d. Harvest Management

The objective identified in the Plan for managing the harvest of giant Canada geese in the Flyway is to provide maximum harvest opportunity for giant Canada geese that is consistent with State/Provincial population objectives, the objectives for other Canada goose populations in the Flyway, and the control of over-abundant goose populations in areas with high human/goose conflicts. Giant Canada geese currently provide widespread harvest opportunities in a region where Canada goose management is becoming increasingly complex. Because of the intermixing of populations on migration and wintering areas and the differential status of the various populations, regulations frameworks developed to manage the harvest of other populations of Canada geese have limited flexibility for harvest of resident Canada geese.

Table I-6. Recent spring population estimates (2001-03 average) and population objectives for giant Canada geese in States and Provinces of the Mississippi Flyway (Mississippi Flyway Council 2001; Moser and Caswell, in press).

State/Province	Population Estimate ^a	Population Objective
Alabama	19,000	25,000
Arkansas	25,000	25,000
Illinois	90,817	80,000
Indiana	121,148	60,000
Iowa	56,019	80,000
Kentucky	34,119	60,000
Louisiana	2,000	4,000
Michigan	268,056	200,000
Minnesota	304,937	182,000
Mississippi	20,000	20,000
Missouri	63,955	40,000
Ohio	110,487	60,000
Tennessee	66,710	45,000
Wisconsin	110,051	68,000
Total - U.S.	1,292,298	949,000
Manitoba - MF portion	70,000	70,000
Ontario - MF portion	82,434	113,000
Total - Canada	152,434	183,000
Total U.S. and Canada	1,444,732	1,132,000

^a Moser and Caswell, in press.

Strategies to achieve the harvest objective include (1) the development of more flexible hunting regulations and special seasons that will permit States and Provinces to achieve desired harvests of giant Canada geese while minimizing harvests of populations of concern, and (2) the development of adequate harvest-derivation procedures so that Canada goose harvest estimates for states and provinces can be accurately apportioned among the various Canada goose populations in the Flyway.

e. Nuisance Control and Damage Relief

The Plan acknowledges that the restoration of giant Canada geese is widely considered one of the greatest wildlife-management success stories of the 20th century. In some instances, however, the restoration programs were too successful and giant Canada geese have become overabundant in some areas. The Plan notes that controlling local populations of giant Canada geese where they create conflicts with humans is a main objective and that control programs should be at the discretion of State and Provincial wildlife agencies with the concurrence of the Federal government. While sport harvest is considered the primary method to control or reduce population levels, the Plan recognizes that it will not be appropriate in all situations and other control methods should be considered. To minimize confusion and streamline processes, the Plan recommends that Federal, State, and Provincial agencies work together to develop uniform plans that give States and Provinces greater flexibility in alleviating human/goose conflicts. The Plan recommends that any birds taken by lethal control measures be given to food-bank programs and that efforts be made to formulate guidelines for distribution. The Plan also emphasizes consideration of the welfare of other Canada goose populations when implementing a control program for giant Canada geese.

3. Central Flyway

a. History

Resident Canada goose populations in the Central Flyway were reduced in the late 19th and early 20th century because of unregulated hunting and commercial exploitation. Beginning in the late 1930's and continuing for the next 40 years, most States and Provinces in the Flyway established captive breeding flocks. Young produced by these flocks were released at breeding sites or transported to suitable habitat. During the period from 1967 to 1999, over 120,000 Canada geese were released as goslings from captive flocks or were trapped and transported to various locations within the Flyway. Essentially all the geese translocated in the 1990's were moved in response to problems the birds were causing in areas from which they were removed. As of 2000, all active restoration programs were scheduled to be terminated, although Saskatchewan and a number of States still move birds from nuisance areas. In 2000, the Central Flyway Council adopted a single plan addressing nuisance control management for the three distinct populations of large Canada geese (Hi-Line, Western Prairie, and Great Plains) in the Flyway.

b. Management Plan Goal

The goal of the Central Flyway management plan (CFMP) is:

“Manage resident Canada geese in the Central Flyway to achieve maximum benefits from these birds while minimizing conflicts between geese and humans.” (Gabig 2000).

c. Population Objectives

Unlike the Atlantic and Mississippi Flyways, the CFMP does not set a single population objective for all resident Canada geese because three distinct management populations of large Canada geese are present in the Flyway. Objectives were set by the Central Flyway in the management plans developed for the individual Canada goose populations based on the best knowledge and information provided by States and Provinces (**Table I-7**). Much of the information used to set population objectives were winter indices

Table I-7. Spring indices of the number of resident Canada geese (2001-03 average) and population objectives in the Central Flyway (Gabig 2000; Moser and Caswell, in press).

State/Province	1999 Spring Population	Population Objective
North Dakota	156,200	60,000 – 100,000
South Dakota	141,300	50,000
Nebraska	32,400	30,000 – 50,000
Kansas	30,000	37,500
Oklahoma	31,895	20,000 – 40,000
Texas	3,000	750
Montana - CF portion	93,088	80,000
Wyoming - CF portion	25,565	9,739
Colorado - CF portion	14,500	12,500
New Mexico - CF portion	1,500	5,300
Total - U.S.	528,948	
Manitoba - CF portion	52,486	
Saskatchewan	290,800	
Total - Canada	342,486	
Total - U.S. and Canada	871,434	

derived from coordinated winter surveys of Canada geese (Gabig 2000). Currently, all Central Flyway large Canada goose populations are above Flyway-established objective levels and one of the main strategies outlined in the CFMP is to maintain goose numbers at levels specified in the individual plans (Gabig 2000). The Flyway recognizes that population monitoring will be important for determining the effectiveness of control measures and recommends a number of strategies where monitoring techniques and/or information is lacking. Understanding the best way to make use of mark/recapture data to estimate population parameters, determining other methods to describe population size and production, and developing population models to assist in management decisions are considered important by the Flyway. Additionally, the Flyway was interested in exploring the efficacy of using Adaptive Resource Management for managing resident geese.

d. Harvest Management

A common objective found in the management plans for large Canada geese in the Central Flyway is to maximize recreational opportunity consistent with the welfare of goose populations, international treaties, and habitat constraints. Harvest and hunting regulations are an important component of this objective. Objective levels for liberal and restrictive harvest have been established by the Flyway for the individual goose populations. Because populations are above these levels, seasons are currently under liberal regulations. As resident goose populations increased and harvest was liberalized, the proportion of large Canada geese in the harvest increased as well. The Flyway monitors the annual harvest of

resident geese by measuring tail fans obtained from hunters through the Parts Collection Survey operated by the Service. Biologists attain harvest estimates by separating large and small Canada geese using tail feather measurements. The Central Flyway recognizes that geese provide other recreational opportunities outside hunting. Gabig (2000) states that a main objective for managing large Canada geese is to ensure positive values associated with resident geese are maintained. To achieve this, the Flyway believes that retaining important viewing opportunities year round is an important strategy as well as sustaining harvest. Building public awareness about the extensive efforts to restore and manage geese in the Flyway and the economic and recreational opportunities geese provide is a high Flyway priority.

e. Nuisance Control and Damage Relief

Because Canada geese have shown great ability to adapt to human settings, a number of conflicts have arisen in the Flyway between humans and geese. Some of the problems were of major concern, especially those involving airports and agricultural depredation, but there was a general dichotomy among the public about the severity of the goose problem and the need for control. The Central Flyway Technical Committee (Gabig 2000) believes two steps are needed to handle resident Canada goose population control issues in the Flyway. The first objective is to implement control methods directed at solving goose-conflict problems and reducing goose populations in a socially and biologically acceptable, site-specific, and effective manner, which primarily deals with Federal, State, and Provincial planning and concerns. The second objective, which concerns public involvement, is to implement public education and cooperative programs that will maximize success of programs initiated under the first objective. To meet the education objective, the Flyway plans to survey the public about feelings and attitudes toward geese and control programs. Sport hunting is considered the Flyway's first choice to control geese but may be impractical in some circumstances and other methods should also be explored. To examine other methods and possible consequences from their implementation, the Flyway created an Action Matrix that specifically addressed social acceptance, cost issues, and projected effects to the goose populations and to the human/goose conflict being resolved (Gabig 2000). Thirteen potential goose control actions are reviewed in the matrix, which range from no action to issuing kill permits, and include development of a depredation order to increase State and Provincial authority and flexibility in goose control matters. The Flyway believes better cooperation is needed among all agencies involved with human/goose conflicts to make control efforts more effective and to increase public awareness. Finally, development of analytical procedures to more effectively analyze goose problems, formulate responses, and analyze results are a high Flyway priority.

4. Pacific Flyway

a. History

Pacific Flyway western Canada geese (*B. c. moffitti*) are currently recognized for management purposes as consisting of two populations, Pacific (PP) and Rocky Mountain (RMP). A large portion of the PP is nonmigratory, with many segments wintering on or near breeding areas, although more northern segments make annual migrations. Through natural pioneering and transplant programs, PP western Canada geese have expanded their historic distribution significantly over the past two decades. A number of State and Federal wildlife management areas continue programs to promote PP western Canada geese. Unlike PP geese, RMP Canada geese are primarily migratory, with geese undertaking spring and fall migrations between breeding and wintering areas (Subcommittee on Pacific Population of Western Canada Geese 2000). Declining goose populations during the early 1950's in the RMP range prompted special regulations restricting harvest on these birds in 1955. After harvest restrictions were implemented, States transplanted geese into unoccupied habitat and several national wildlife refuges and State wildlife management areas were established within the range of the RMP to target enhancement of this population. In response to increasing populations in the 1980's and 1990's, regulations were gradually liberalized. Efforts to enhance nesting opportunities for these geese decreased as the population improved and depredation problems increased (Subcommittee on Rocky Mountain Canada Geese 2000). Depredation problems have also occurred within the range of PP geese. To address depredation problems with both migrant and resident birds in northwest Oregon and southwest Washington, a Canada goose agricultural depredation control management plan was developed in 1998 (Pacific Flyway Council 1998).

b. Management Plan Goals

The goal of the Flyway management for PP geese is:

“The goal of this management plan is to maintain PP western Canada geese at a level and distribution that will optimize recreational opportunity and minimize depredation and/or nuisance problems in agricultural and urban areas.” (Subcommittee on Pacific Population of Western Canada Geese 2000),

and for RMP geese is:

“The goal of this management plan is to maintain the Rocky Mountain population of western Canada geese at a level and distribution that optimizes recreational opportunity and reduces depredation and nuisance problems.” (Subcommittee on Rocky Mountain Canada Geese 2000).

c. Population Objectives

The Pacific Flyway established separate population objectives for their two populations of western Canada geese. The RMP plan set a breeding population objective of 115,000 birds (**Table I-8**) whereas the PP plan listed population objectives separately for each State and Province (**Table I-9**). Both plans specify maintenance of current distributions as a primary objective. Concern is noted in both plans about difficulties in tracking population parameters as populations continue to grow and expand. The RMP plan

Table I-8. Breeding population indices, objectives, and harvest management levels for the Rocky Mountain Population of Western Canada Geese (Subcommittee on Rocky Mountain Canada Geese 2000).

Area	Breeding Pair Index	Breeding Population Index	Breeding Population Index Objective	Restrictive Level ^a	Liberalization Level ^b
Southern Alberta ^c		81,700	60,000	45,000	75,000
Central Montana		27,600	30,000	15,000	28,000
Southeastern Idaho	2,520		5,540	4,160	7,940
Western Wyoming	4,860		12,000	9,000	15,000
Central Wyoming	3,256		6,050	4,550	7,560
Northwestern Colorado	190		460	340	560
Northern Utah	760		1,520	1,140	1,900
Southern Utah	120		240	200	300
Northeastern Nevada	310		700	520	900
Southern Nevada	100		220	160	260
Eastern Arizona		40	100	40	160
Northwestern New Mexico		100	200	150	250
Total	12,116	109,440	117,030	80,260	137,830

^a When the 3-year average population index is below the Restriction Level, harvest restrictions should be considered.

^b When the 3-year average population index is above the Liberalization Level, consideration should be given to increasing harvest rates.

^c Numbers are provisional for Alberta and will be adjusted as new data becomes available.

recommends getting more information about northern molting and breeding areas and to identify areas where different populations (e.g. RMP and Hi-Line) overlap or exchange. The PP plan also recognizes the need to improve coordinated surveys and increase banding efforts.

d. Harvest Management

Both Pacific Flyway management plans list provision of optimum hunting opportunities and viewing, educational, and scientific pursuits as primary objectives. RMP geese have become the most important component of goose harvest in interior Flyway States. Although hunter use-days have declined, harvest now exceeds 150,000 RMP birds annually. The RMP plan outlines basic guidelines for setting liberal, moderate, and restrictive seasons based on the most recent 3-year average of spring breeding-population indices. The Plan recommends restrictive seasons for indices of less than 82,300 birds, moderate seasons when the average falls between 82,300 and 119,800 birds, and liberal seasons when average indices exceed 119,800 birds. The Plan indicates special recognition should be given to hunting regulations in reference areas that supply geese to other portions of the Flyway. The Flyway recommended implementation of banding programs, harvest surveys, and other research to reliably estimate harvest within the RMP range where there is potential to mix with PP and Hi-Line populations.

Table I-9. Harvest management levels for the Pacific Population of Western Canada Geese (Subcommittee on Pacific Population of Western Canada Geese 2000).

Unit	Restriction Level ^a	Liberalization Level ^b
British Columbia	8,500 pairs	12,500 pairs
Alberta	18,750 geese	31,250 geese
Western Washington	800 nests	1,500 nests
Eastern Washington	1,300 nests	2,000 nests
Western Oregon	8,000 geese	14,000 geese
Eastern Oregon	36,000 geese	60,000 geese
California	1,000 pairs	1,250 pairs
Nevada	600 pairs	1,000 pairs
Southwest Idaho	1,000 pairs	1,500 pairs
Panhandle Idaho	120 nests	200 nests
Montana	1,200 geese	2,000 geese

^a When the 3-year average population index is below the Restriction Level, harvest restrictions should be considered.

^b When the 3-year average population index is above the Liberalization Level, consideration should be given to increasing harvest rates.

Guidelines are established in the PP plan for harvest levels, by reference area. Inexact measures of the harvest are a problem in PP goose management and solutions like those in the RMP plan are recommended. Each Plan recognizes the importance of resident Canada geese for wildlife viewing on Federal refuges, State wildlife areas, and urban locations.

e. Nuisance Control and Damage Relief

As RMP and PP geese have increased, so have depredation concerns. Evaluation of depredation and nuisance issues and implementation of appropriate management actions are a primary objective in both Plans. In 1998, the Pacific Flyway Council issued a Depredation Policy Statement as part of the Northwest Oregon/Southwest Washington Agricultural Depredation Control Plan. The Depredation Control Plan was developed primarily to address problems associated with the increasing size of the migrant Canada goose population but deals with resident geese as well. The PP management plan references the Flyway Depredation Policy as the guide to managing agricultural depredation. One of the principles generated was to use public hunting as the preferred method for reducing agricultural depredation by game birds. The preference of the Depredation Policy to use sport hunting as the primary method to control depredation does not apply to urban geese. Therefore, it is recommended that agencies implement programs to assist landowners on agricultural and non-agricultural lands. APHIS/WS is authorized to assist landowners with goose complaints but funding has been minimal or nonexistent. The Flyway recommended finding stable sources of funding to maintain consistent assistance to landowners. Additionally, when developing a plan, the Flyway recommends kill permits be a part of the management scheme and should be evaluated based on local needs. Flyway policies should be evaluated on an annual basis and altered as needed. Within the RMP range, depredation and nuisance problems have remained minor and have been dealt with by local authorities on a case-by-case basis. One exception is southern Alberta where the problem continues to grow. Similar to the PP plan, the RMP Subcommittee recommends agencies implement programs that initiate management actions to assist landowners and that

partnerships should be formulated with municipalities to address urban goose problems. Stable funding sources necessary to maintain such programs should be sought as well.

5. Relationship of Flyway Management Plans to the EIS

Since the conception of flyway management in the 1930s by Frederick Lincoln (1935) and the Service's initiation of flyway management in 1948, flyways have served as the administrative units for waterfowl management. Likewise, the organization of States into flyway councils followed a logical progression in the development of flyway management (USDI 1988). Over the years, the history and function of the Councils has been well documented (see Hawkins et al. 1984) and their stature and influence have grown.

While the Service and the Councils initially focused attention on the establishment of hunting regulations, increased management capabilities have allowed this traditional relationship and role to expand. A natural progression of this relationship has led to the development of cooperatively developed management plans. These management plans have been developed for a wide variety of species and activities, and have been appropriate mechanisms to address national and international issues related to population goals and objectives, harvest considerations, and information needs.

The role of the EIS is to act as an umbrella document for the management of resident Canada geese and to act as a comprehensive programmatic plan to guide and direct resident Canada goose population growth and management activities in the conterminous United States. In particular, operating under the fundamental premise that fewer birds in the various populations will translate to fewer existing and potential conflicts, the EIS evaluates the various alternative strategies to reduce, manage, and control resident Canada goose populations in the continental United States and to thereby reduce related damages. Further, the objective of this EIS and any ultimate proposal is to provide a regulatory mechanism that would allow State and local agencies, other Federal agencies, and groups and individuals to respond to damage complaints or damages by resident Canada geese. The means must be more effective than the current system; environmentally sound, cost-effective, flexible enough to meet the variety of management needs found throughout the flyways, should not threaten viable resident Canada goose populations as determined by each Flyway Council, and must be developed in accordance with the mission of the Service.

Formulating a national management strategy to reduce, manage, and control resident Canada goose populations in the continental United States and to reduce related damages is a complex problem and Flyway input is essential for incorporating regional differences and solutions. The EIS emphasizes and synthesizes management recommendations from the Flyway plans that have national implications while maintaining Flyway autonomy for issues distinct to each.

As such, it should be remembered that the overall population objectives established by the Flyways were derived independently based on the States' respective management needs and capabilities, and in some cases, these objectives are an approximation of population levels from an earlier time when problems were less severe. In other cases, objectives are calculated from what is professionally judged to be a more desirable or acceptable density of geese. It should be further noted that these population size are only optimal in the sense that it is each Flyway's best attempt to balance the many competing considerations of both consumptive and nonconsumptive users and that population objectives should be

periodically reviewed and/or revised in response to changes in goose populations, damage levels, public input, or other factors.

We also note that, as a whole, there are many points of similarity within the Flyway plans that can be used as elements of concordance. Improving surveys to better monitor population trends and harvest, increasing our ability to delineate population boundaries and breeding areas, establishing public education programs about resident Canada goose issues, and prompting agencies to work cooperatively to solve problems are just a few of the common objectives.

F. SCOPING/PUBLIC PARTICIPATION

1. Background

On August 19, 1999, the Service, in cooperation with the Wildlife Services program of the United States Department of Agriculture, Animal and Plant Health Inspection Service, published a Notice of Intent to prepare an Environmental Impact Statement on resident Canada goose management (Federal Register 1999c) (**Appendix 6**). This action was in response to the growing numbers of Canada geese that nest and reside predominantly within the conterminous United States and the Service's desire to examine alternative strategies to control and manage resident Canada geese that either pose a threat to health and human safety or cause damage to personal and public property. The notice identified six preliminary alternatives:

No Action Alternative

Under the No Action Alternative, no additional regulatory methods or strategies would be authorized. We would continue the use of special hunting seasons, the issuance of depredation permits, and the issuance of special Canada goose permits. These permits would continue to be issued under existing regulations.

Increased Promotion of Non-lethal Control and Management

Under this alternative, we would actively promote the increased use of non-lethal management tools, such as habitat manipulation and management, harassment techniques, and trapping and relocation. While permits would continue to be issued under existing regulations, no additional regulatory methods or strategies would be introduced.

Nest and Egg Depredation Order

This alternative would provide a direct population control strategy for resident Canada goose breeding areas in the U.S. This alternative would establish a depredation order authorizing States to implement a program allowing the take of nests and eggs to stabilize resident Canada goose populations without threatening their long-term health. Monitoring and evaluation programs are in place, or would be required, to estimate population sizes and prevent populations from falling below either the lower management thresholds established by Flyway Councils, or individual State population objectives. Since the goal of this alternative would be to stabilize breeding populations, not direct reduction, no appreciable reduction in the numbers of adult Canada geese likely would occur.

Depredation Order for Health and Human Safety

This alternative would establish a depredation order authorizing States to establish and implement a program allowing the take of resident Canada goose adults, goslings, nests and eggs from populations

posing threats to health and human safety. The intent of this alternative is to significantly reduce or stabilize resident Canada goose populations at areas such as airports, water supply reservoirs, swimming beaches, and other such areas, where there is a demonstrated threat to health and human safety, without threatening the population's long-term health. Monitoring and evaluation programs are in place, or would be required, to estimate population sizes and prevent populations from falling below either the lower management thresholds established by Flyway Councils, or individual State population objectives. Under this alternative, some appreciable localized reductions in the numbers of adult geese could occur.

Conservation Order

This alternative would authorize direct population control strategies such as nest and egg destruction, gosling and adult trapping and culling programs, or other general population reduction strategies on resident Canada goose populations in the U.S. This alternative would establish a conservation order authorizing States to develop and implement a program allowing the take of geese posing threats to health and human safety and damaging personal and public property. The intent of this alternative is to significantly reduce or stabilize resident Canada goose populations at areas where conflicts are occurring without threatening the long-term health of the overall population. Monitoring and evaluation programs are in place, or would be required, to estimate population sizes and prevent populations from falling below either the lower management thresholds established by Flyway Councils, or individual State population objectives. State breeding populations would be monitored annually each spring to determine the maximum allowable take under the conservation order. Under this alternative, some appreciable localized reductions in the numbers of adult geese likely would occur and lesser overall population reductions could occur.

General Depredation Order

This alternative would authorize direct population control strategies such as nest and egg destruction, gosling and adult trapping and culling programs, or other general population reduction strategies on resident Canada goose populations in the U.S. This alternative would establish a depredation order allowing any authorized person to take geese posing threats to health and human safety and damaging personal and public property. The intent of this alternative is to significantly reduce resident Canada goose populations in areas where conflicts are occurring. Monitoring and evaluation programs are in place, or would be required, to estimate population sizes and prevent populations from falling below either the lower management thresholds established by Flyway Councils, or individual State population objectives. Under this alternative, some appreciable localized reductions in the numbers of adult geese likely would occur and lesser overall population reductions could occur.

In addition to describing the preliminary alternatives, the August 19 Notice reiterated that the primary purpose of the scoping process was to determine which management alternatives for the control of resident Canada goose populations would be analyzed in the EIS. Public comment was solicited on each of the identified preliminary alternatives and other potential alternatives.

The notice also identified potentially affected resource areas and indicated that we would conduct an analysis of each area, by alternative, in the EIS. Resource areas identified included:

- (1) Resident Canada goose populations and their habitats
- (2) Human health and safety
- (3) Public and private property damage and conflicts
- (4) Sport hunting opportunities

(5) Socioeconomic effects

Public comment was solicited on other potentially affected resource areas.

2. Public Scoping Meetings

A notice was published on December 30, 1999, identifying nine public scoping meeting locations (Federal Register 1999d) (**Appendix 7**). The meetings were held on the following dates at the indicated locations and times:

1. February 8, 2000; Nashville, Tennessee, at the Ellington Agricultural Center, Ed Jones Auditorium, 440 Hogan Road, 7 p.m.
2. February 9, 2000; Parsippany, New Jersey, at the Holiday Inn, 707 Route 46 East, 7 p.m.
3. February 10, 2000; Danbury, Connecticut, at the Holiday Inn, 80 Newtown Road, 7 p.m.
4. February 15, 2000; Palatine, Illinois, at the Holiday Inn Express, 1550 East Dundee Road, 7 p.m.
5. February 17, 2000; Bellevue, Washington, at the DoubleTree Hotel, 300 - 112th Avenue S.E., 7 p.m.
6. February 22, 2000; Bloomington, Minnesota, at the Minnesota Valley National Wildlife Refuge Visitors Center, 3815 East 80th Street, 7 p.m.
7. February 23, 2000; Brookings, South Dakota, at South Dakota State University, Northern Plains Biostress Laboratory, Room 103, Junction of North Campus and Rotunda Lane, Brookings Inn, 2500 Sixth Street, 7 p.m.
8. February 28, 2000; Richmond, Virginia, at the Virginia Department of Game and Inland Fisheries Headquarters, Board Room, 4000 West Broad Street, 7 p.m.
9. March 1, 2000; Denver, Colorado, at the Colorado Department of Wildlife, Northeast Region Service Center, Hunter Education Building, 6060 Broadway, 7 p.m.

At the scoping meetings, we accepted oral and/or written comments. All who wished to present comments were permitted to do so. Over 1,250 people attended the nine public scoping sessions.

3. Written Comments

Public comments were accepted from the opening of the comment period on August 19, 1999, until March 30, 2000. Over 3,000 comments, including approximately 1,500 electronic comments, were received. Analysis of the comments were separated into seven major groups: private individuals, businesses, non-governmental groups (NGOs), local government agencies and associations, Federal agencies, State agencies, and Flyway Councils and Canadian interests. A complete discussion of comments is contained in a separate report Scoping/Public Participation Report for Environmental Impact Statement on Resident Canada Goose Management (**Appendix 8**). All comments were considered in the development of the draft EIS.

G. DRAFT EIS/PUBLIC PARTICIPATION

1. Background

On March 1, 2002, and March 7, 2002, the Service, in cooperation with the Wildlife Services program of the United States Department of Agriculture, Animal and Plant Health Inspection Service, published a

Notice of Availability for a DEIS on resident Canada goose management (Federal Register 2002a; Federal Register 2002b) (**Appendix 12 and 13**). The DEIS evaluated seven principal seven alternatives. These alternatives were developed and further refined as a result of the public scoping process (see **I.F. SCOPING/PUBLIC PARTICIPATION**).

The DEIS also included an analysis of the potential impacts of each alternative on various resource areas. Resource areas included: resident Canada geese, other wildlife species, natural resources, special status species, socioeconomics, historical resources, and cultural resources.

2. Public Meetings

A subsequent notice was published on March 26, 2002, identifying eleven public meeting locations (Federal Register 2002c) (**Appendix 14**). The eleven public meetings were held on the following dates at the indicated locations and times:

1. April 1, 2002; Dallas, Texas, at the Hyatt Regency Downtown, 300 Reunion Boulevard, 7 p.m.
2. April 23, 2002; Palatine, Illinois, at the Holiday Inn Express, 1550 E. Dundee Road, 7 p.m.
3. April 24, 2002; Waupun, Wisconsin, at the Waupun High School, 801 E. Lincoln, 7 p.m.
4. May 7, 2002; Franklin, Tennessee, at Franklin Cool Springs Marriott, 700 Cool Springs Blvd., 7 p.m.
5. May 14, 2002; Bloomington, Minnesota, at the Minnesota Valley National Wildlife Refuge Visitors Center, 3815 East 80th Street, 7 p.m.
6. May 15, 2002; Brookings, South Dakota, at Brookings Area Multiplex, 824 32nd Avenue, 7 p.m.
7. May 20, 2002; Richmond, Virginia, at the Comfort Inn Conference Center, 3200 W. Broad Street, 7 p.m.
8. May 21, 2002; Danbury, Connecticut, at the Holiday Inn, 80 Newtown Road, 7 p.m.
9. May 22, 2002; North Brunswick, New Jersey, at the Ramada Inn, 999 U.S. Route 1 South, 7 p.m.
10. May 29, 2002; Denver, Colorado, at the Colorado Department of Wildlife, Northeast Region Service Center, Hunter Education Building, 6060 Broadway, 7 p.m.
11. May 30, 2002; Bellevue, Washington, at the DoubleTree Hotel, 300 - 112th Avenue S.E., 7 p.m.

At the meetings, we accepted either oral and/or written comments. All who wished to present comments were permitted to do so. Approximately 429 people attended the eleven public sessions.

3. Written Comments

Public comments were accepted from the opening of the comment period on March 1, 2002, until May 30, 2002, and after publication of a subsequent notice, from August 21, 2003, until October 20, 2003 (Federal Register 2003a) (**Appendix 15**). Thus, we considered all comments received between March 1, 2002, and October 20, 2003. Over 2,600 comments were received. A complete summary of comments is contained in a separate report Public Participation Report for Draft Environmental Impact Statement on Resident Canada Goose Management (**Appendix 16**). All comments were considered in the development of the FEIS. A complete discussion and analysis of these comments, along with the Service response, can be found in section **X. PUBLIC COMMENT ON DEIS AND SERVICE RESPONSE**.